

# ELYTRAL INTERVAL POLYMORPHISM IN ANTHONOMUS GRANDIS BOHEMAN AND ANTHONOMUS VESTITUS BOHEMAN (COLEOPTERA: CURCULIONIDAE)<sup>1, 2</sup>

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Polymorphism of the 4th elytral interval of *Anthonomus vestitus* Boheman in Peru was observed during a recent taxonomic study of this species. Similar polymorph variants were later found among specimens of the cotton boll weevil, *Anthonomus grandis* Boheman, from North and South America. A preliminary survey of available material of these two species indicated that in a given population the modifications of the interval may either be present in varying degrees or entirely absent. Furthermore, there is a definite correlation of the frequency of the polymorphic forms with certain geographic areas. Although much has been written on various kinds of polymorphism in insects and other animals, no previous mention of elytral interval polymorphism in any curculionids appears to have been made in the literature.

The elytral intervals of *A. grandis* and *A. vestitus* are typically slightly convex, usually about equal in width, and are clearly delimited by rows of punctures commonly called striae (fig. 1). In these two species the 4th interval may also either be narrowed (fig. 2) or completely interrupted (figs. 3, 4) near the base. Sometimes the striae delimiting the 4th interval coalesce (fig. 3) pinching off the interval, while in other cases these two striae are themselves interrupted (fig. 4) for a short distance. In the latter instance a slightly elevated bridge connects the 3rd and 5th intervals. The effect produced by either of the latter two modifications is a complete interruption of the 4th interval. Both elytra of an individual are usually similarly affected whenever there is any deviation from the normal form. However, many instances were noted where the 4th interval of one elytron was interrupted while the same interval on the opposite elytron was only narrowed or, less frequently, normal. Striae bordering the 4th interval may coalesce on one elytron and be completely interrupted on the opposite elytron. The frequency of occurrence of these morphs was observed to be approximately the same in both sexes.

In the following discussion on *A. grandis* only interrupted interval morphs are considered. Narrowed interval morphs do not appear to be as common in this species as in certain populations of *A. vestitus*. It should be noted here that an individual was counted as an interrupted interval morph if it had either one or both 4th intervals interrupted.

The highest incidence of elytral interval interruption in *A. grandis* occurs in Texas, the southeastern United States, and Venezuela. All samples

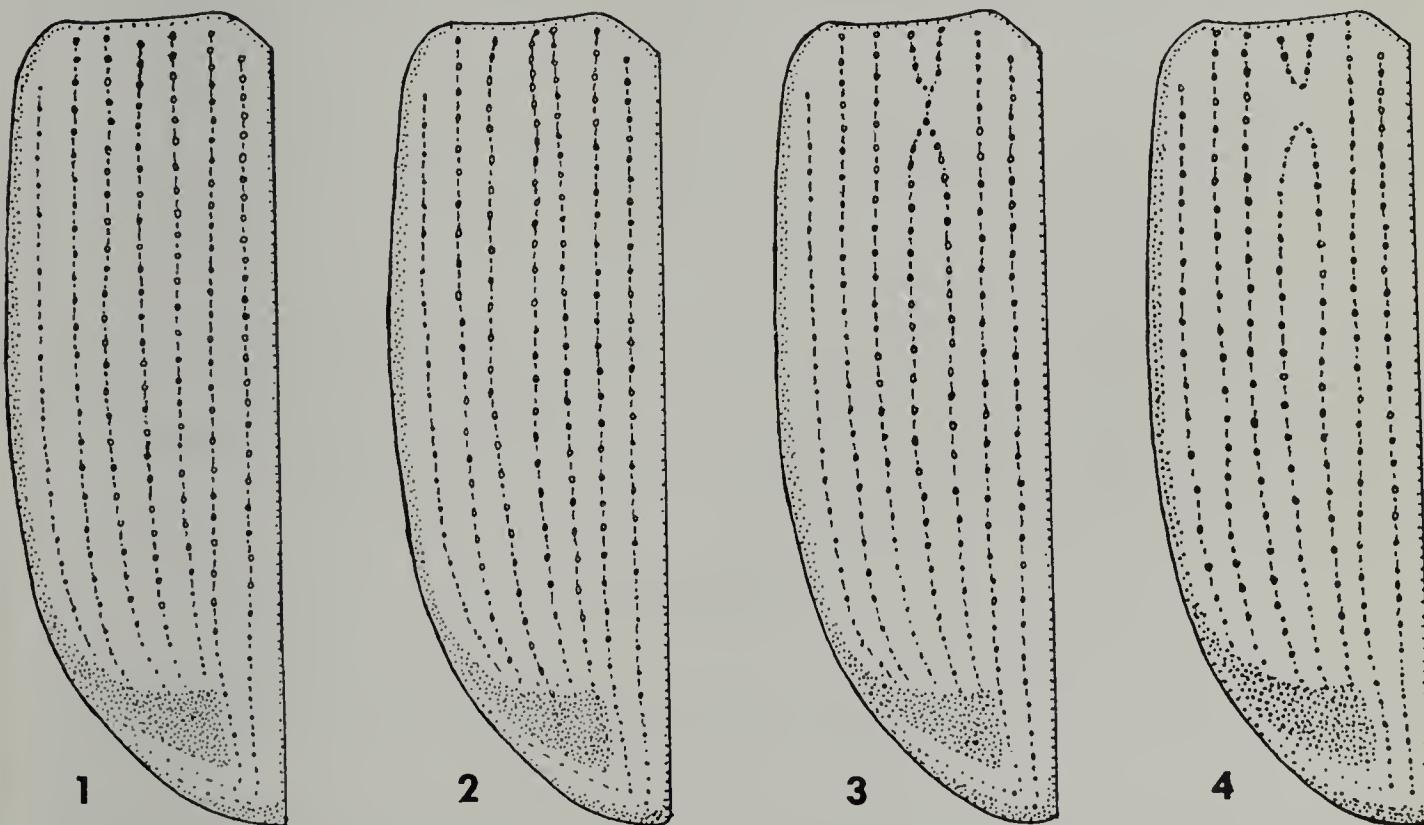
<sup>1</sup> Technical contribution No. 5349, Department of Entomology, Texas Agricultural Experiment Station, Texas A&M University, College Station, Texas.

<sup>2</sup> This study was financed in part by U. S. Department of Agriculture Research and Service Contract #12-14-100-7733(33).

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examined from these areas contained some interrupted interval morphs, although the frequency of these morphs varied considerably between the various localities. Percentages of interrupted interval morphs collected on cultivated cotton from localities within these areas are as follows (number of specimens examined in parentheses): Orangeburg Co., S. C., 20.8 (72); Issaquena Co., Miss., 12.3 (57); Fayetteville, Ark., 27.4 (73); Oklahoma, 22.6 (31); Dickens Co., Tex., 17.9 (56); Falls Co., Tex., 9.7 (103); Collingsworth Co., Tex., 12.9 (70); Runnels Co., Tex., 5.7 (70); Hardeman Co., Tex., 9.8 (61); El Paso, Tex., 40.0 (15); Brownsville, Tex., 3.2 (62); and Venezuela, 20.5 (44). A sample of 12 weevils reared from *Cienfuegosia sulphurea* in Nueces Co., Tex., contained 33.3% interrupted interval morphs. The frequency of interrupted interval morphs in a sample from Venezuela is comparable with that found in some areas in the southeastern United States. This along with certain other similarities in weevils from these two areas suggests that probably weevils now attacking cotton in Venezuela developed from one or more fairly recent introductions from the southeastern United States.

Considerably fewer interrupted interval morphs were usually found in samples from northeastern and north-central Mexico as compared with the frequency of this variant in most populations in adjacent Texas. The percentages of interrupted interval morphs collected on cultivated cotton from various localities in these areas in Mexico are as follows: Valadeces, Tamps., 11.1 (36); Tampico, Tamps., 3.6 (56); near Monterrey, N. L., 4.1 (74); Rio Nazas, Dgo., 1.5 (67); and Delicias area, Chih., 0.0 (69). It is of interest that the study of other characters of the species, such as the spermatheca, scutellum, metepisternum and pronotal setae, indicates



FIGURES 1-4—*Anthonomus grandis* Boheman, left elytron of elytral interval morphs from Fayetteville, Arkansas. 1—Normal 4th elytral interval. 2—Narrowed 4th elytral interval. 3—Interrupted 4th elytral interval, with striae coalescing. 4—Interrupted 4th elytral interval, with striae interrupted.

that northeastern and north-central Mexico apparently represents a transitional zone between weevils farther south in Mexico and those of Texas.

Several samples of weevils from cultivated cotton in Arizona, Sonora, and Sinaloa were examined but only three of these contained individuals with interrupted intervals. The percentages of these morphs in the three samples are: Hyder, Ariz., 4.7 (86); Caborca, Son., 1.3 (80); and Guasave, Sin., 1.5 (69). No interrupted interval morphs occurred in two samples totaling 185 weevils collected on *Gossypium thurberi* in Arizona. Available material from cultivated cotton in El Salvador, Honduras and Nicaragua also did not include any of these morphs.

Interrupted interval morphs of *Anthonomus vestitus* Boheman constitute only a small proportion of weevils examined from cultivated cotton in the Peruvian departments of Lima and La Libertad, and appear not to occur at all in the more northern departments of Piura, Amazonas and Lambayeque. The percentages of these morphs in material examined were recorded as follows: Cañete, Lima, 6.0 (100); Pativilca, Lima, 2.2 (45); and La Libertad, 2.6 (38). Narrowed interval morphs were observed by H. R. Burke and W. H. Cross (unpublished data) to occur in all of the Peruvian departments from which sufficient samples were available, but the frequency of these variants was much higher in the more southern departments of Lima and Ica. The percentages of narrowed interval morphs in samples from departments arranged from north to south in Peru are: Piura, 1.8 (56); Amazonas, 28.0 (25); Lambayeque, 5.2 (19); La Libertad, 8.6 (35); Lima, 65.3 (95); and Ica, 57.1 (14).

Small numbers of a few other species of *Anthonomus* were examined but *Anthonomus fulvus* LeConte was the only one of these found to possess elytral interval polymorphism. Two out of 25 specimens of the latter species exhibited the same type of polymorphism as *A. grandis* and *A. vestitus*.

The foregoing account of elytral interval polymorphism in *A. grandis* and *A. vestitus* is preliminary. The objectives here were to show that such polymorphism exists and to point out the correlation between incidence of these polymorph variants and geographic areas. Elytral interval polymorphism is presently being used by the author as an additional factor in evaluating geographic variation in the two species and may be of some value in future studies on their genetics. Information derived from field and laboratory studies is now needed as a basis for attempting to determine the nature and significance of this phenomenon.

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## LITERATURE NOTICE

EGG BURSTERS AND HATCHING IN THE CERAMBYCIDAE (COLEOPTERA). By L. M. Gardiner. Canad. Jour. Zool. 44: 199-212, 57 figs. 1966.—Form and occurrence of so-called egg bursters on first instar larvae of 40 species are discussed. Studies of these structures in relation to hatching show that they perform an important ambulatory, as well as egg bursting, function. It is proposed that they should be more appropriately termed "hatching spines."